Considerations to Improve the Evidence-Based Use of Vaginal Hysterectomy in Benign Gynecology

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Vaginal hysterectomy fulfills the evidence-based requirements as the preferred route of hysterectomy for benign gynecologic disease. Despite proven safety and effectiveness, the vaginal approach for hysterectomy has been and remains underused in surgical practice. Factors associated with underuse of vaginal hysterectomy include challenges during residency training, decreasing case numbers among practicing gynecologists, and lack of awareness of evidence supporting vaginal hysterectomy. Strategies to improve resident training and promote collaboration and referral among practicing physicians and increasing awareness of evidence supporting vaginal hysterectomy can improve the primary use of this hysterectomy approach.

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For more than a century, the two basic approaches for hysterectomy were vaginal and abdominal, with vaginal hysterectomy offering several advantages over the abdominal approach (total abdominal hysterectomy [TAH]) in terms of morbidity. During the past 25 years, various alternative endoscopic techniques for minimally invasive hysterectomy have been introduced, including laparoscopically assisted vaginal hysterectomy, total laparoscopic hysterectomy, and laparoscopic supracervical hysterectomy. Most recently, microprocessor-based remote-controlled endoscopic assistance (commonly referred to as “robotics”) has been introduced, leading to the performance of robotic hysterectomy. Recent statistics indicate significant increases in the use of laparoscopic hysterectomy and robotic hysterectomy in treating benign gynecologic disease.

However, it must be recognized that the use of laparoscopic and robotic technologies has not been entirely evidence-based and has been associated with significant industry marketing. Improved visualization with endoscopic techniques has been claimed to be an important benefit of laparoscopic hysterectomy and robotic hysterectomy. However, there is level 1 evidence that in many, if not most, hysterectomies, the increased visualization with endoscopic approaches offers no benefit and increases cost compared with vaginal hysterectomy.

Total laparoscopic hysterectomy, for example, costs on average $3,500 more per case and robotic hysterectomy more than $5,000 more per case than vaginal hysterectomy.

From an evidence-based perspective, vaginal hysterectomy is the least invasive approach and is associated with shorter recovery time, fewer complications, less cost, and better cosmetic results than other types of hysterectomy. Position statements from the American College of Obstetricians and Gynecologists and the American Association of Gynecologic Laparoscopists endorse vaginal hysterectomy as the preferred route of hysterectomy for benign disease.

Despite the supporting scientific evidence, improved patient safety, and favorable economic
considerations, vaginal hysterectomy appears to be underused in treating benign gynecologic conditions. Current statistics in the United States indicate that, overall, fewer than 20% of hysterectomies are performed using the vaginal approach.\(^6\) The fact that percentages of each type of hysterectomy vary greatly among centers in the United States as well as across the world suggests that higher percentages of vaginal hysterectomy could be performed for benign gynecologic conditions. In Sweden, for example, vaginal hysterectomy rates increased from 4% in 1987 to 31% in 2003 and in Finland from 18% in 1996 to 44% in 2006 as a result of active strategies to promote this approach.\(^7,8\) The Society of Gynecologic Surgeons’ Education Committee identifies three critical factors associated with underuse of vaginal hysterectomy: 1) inadequate surgical training resulting from diminished cases in residency, 2) difficulty maintaining surgical skills in practice as a result of low surgical volumes, and 3) increased marketing and awareness of alternative hysterectomy techniques that result in vaginal hysterectomy appearing less attractive as a surgical option. It is hoped that promoting changes in these areas can improve the evidence-based use of vaginal hysterectomy as the primary approach to hysterectomy.

### SURGICAL TRAINING IN RESIDENCY

In 2008, Julian noted that few graduating residents felt comfortable performing vaginal hysterectomy.\(^9\) Surveys indicate that only 27.8% of residents in 2010 felt comfortable performing vaginal hysterectomy independently compared with 79% before 2008.\(^10,11\) With the increasing number of hysterectomy approaches, residents have more exposure to multiple surgeons performing multiple types of surgery but often end up with insufficient case numbers to achieve proficiency in any single hysterectomy technique. Recent literature suggests that vaginal hysterectomy proficiency is achieved after 21–27 cases and residents report feeling more comfortable with vaginal hysterectomy after performing more than 20 cases in training.\(^12,13\) Laparoscopic techniques tend to require more cases to achieve proficiency with some studies suggesting a learning curve of 30 cases and others recommending up to 125 cases to achieve a plateau of performance.\(^4,15\) It has been suggested that robotic techniques are easier to learn than laparoscopic techniques; however, data indicate the learning curve for robotic hysterectomy is at least 50 cases and a recent study from Mayo Clinic indicates a plateau of proficiency after 90 cases.\(^16,17\)

Historically, residency training programs have been expected to provide equal training for all residents and risked citations if there was variation in case numbers between residents. In some cases, maintaining compliance with equal training could result in all residents in a program receiving insufficient experience to achieve proficiency in some procedures. In a July 2012 letter to residency program directors, the Accreditation Council for Graduate Medical Education announced the establishment of minimum case requirements for resident training. For hysterectomy, the minimum requirements are 15 vaginal hysterectomies, 20 laparoscopic hysterectomy and 35 TAHs. With the establishment of these minimum numbers, programs now have more flexibility to use case volumes to meet the specific needs of trainees without the requirement to provide equal numbers to all residents. This is advantageous for programs with limited numbers of hysterectomy cases, because they can now identify those residents who have an aptitude and desire for surgical training and provide them sufficient numbers of cases to attain proficiency in vaginal hysterectomy during residency.

### MAINTAINING SKILL IN PRACTICE

It is likely that the persistent use of abdominal hysterectomy in clinical practice is primarily related to lack of experience with minimally invasive hysterectomy techniques among practicing gynecologic surgeons and their relative comfort with performing TAH. This is understandable considering many do not achieve sufficient training in minimally invasive hysterectomy during residency and, more importantly, even for those who do, most are not able to perform sufficient numbers of cases in practice to maintain the necessary skills to safely perform minimally invasive techniques.

In 2001, Chez et al\(^18\) noted decreasing numbers of hysterectomies on case lists provided by physicians early in their careers with a mean of 15 hysterectomies performed annually, the majority with fewer than six vaginal hysterectomies per year in 1995 and in 1997. The relationship between surgical volume and improved surgical outcomes and lower costs has been well documented, particularly for hysterectomy techniques.\(^19,20\) Improvements in nonsurgical treatments for common gynecologic conditions have resulted in further reductions in the number of patients undergoing hysterectomy. Recent data indicate the majority of gynecologists in the state of New York perform fewer than four hysterectomies per year and the majority does not perform vaginal hysterectomy.\(^19\) It is simply not realistic for gynecologists to maintain skills in any minimally invasive hysterectomy technique (vaginal hysterectomy, laparoscopic hysterectomy, robotic hysterectomy) performing such a low number of cases. As practice patterns continue to change, there is less
opportunity for low-volume surgeons to learn from experienced senior mentors, particularly for vaginal hysterectomy. Vaginal surgery expertise continues to shift to higher-volume surgeons focused on benign gynecologic surgery as opposed to obstetrics and to surgeons who perform a significant number of prolapse cases, many of whom are subspecialists in female pelvic medicine and reconstructive surgery. Similar to the shift of vaginal hysterectomy to high-volume vaginal surgeons, many advanced laparoscopic procedures, including laparoscopic hysterectomy, are shifting to surgeons who focus their practice on laparoscopic surgery. The rapidly increasing number of fellowships in minimally invasive gynecologic surgery is an indication of the need for further training in advanced laparoscopic techniques after residency.

The introduction of robotic technology in gynecology was heralded as an enabling technology that would make it easier for surgeons to perform minimally invasive hysterectomy. As with most surgical procedures, it is now clear that robotic hysterectomy requires unique skills that are dependent on sufficient training and case volumes. In fact, the introduction of robotics has highlighted the need for ongoing monitoring of training and credentialing in advanced surgical techniques. The importance of maintaining skills through sufficient case volume and ongoing monitoring of outcomes is now a key focus in all surgical specialties. The trend toward high-volume surgeons performing increased proportions of hysterectomies is logical and inevitable. The American Association of Gynecologic Laparoscopists has stated “surgeons without the requisite training and skills required for the safe performance of vaginal hysterectomy or laparoscopic hysterectomy should enlist the aid of colleagues who do or should refer patients requiring hysterectomy to such individuals for their surgical care.”

A model using a balanced approach with appropriate incentives and expert surgeons functioning as proctors to promote vaginal and laparoscopic hysterectomy has been shown to increase minimally invasive hysterectomy rates from 38% to 78% without resorting to robotic assistance.

Considering the distinct advantages of vaginal hysterectomy compared with other hysterectomy techniques, individual centers and hospitals should be encouraged to develop and promote models that result in increased vaginal hysterectomy rates. Simple guidelines can be used to identify appropriate patients who are candidates for vaginal hysterectomy.

Dayaratna et al reported that using criteria of at least one prior vaginal delivery, no more than one prior laparotomy, and a uterine size less than 14 weeks would increase the number of vaginal hysterectomy cases by more than 30%.

MARKETING AND AWARENESS OF OTHER HYSTERECTOMY TECHNIQUES

The rapid adoption of robotic surgery, especially for benign gynecologic surgery, despite level 1 evidence of increased costs without benefit, is a prime example of the powerful effect that marketing can have on the use of new technology. Technology can lead to advances, but in health care, maintaining balance among effectiveness, safety, and expense is critical when determining how best to incorporate new techniques. One troublesome effect of new technology is the confusion created by new terminology associated with the technology, which can also be influenced by marketing. In the realm of hysterectomy, we have gone from two choices—abdominal and vaginal—to an ongoing list of procedures and acronyms (some trademarked) that make it difficult for patients, the public, and many health care providers to understand the details of each type of procedure being performed. Despite the long existence of vaginal hysterectomy, marketing of endoscopic techniques has led many to erroneously believe laparoscopic hysterectomy and robotic hysterectomy are less invasive approaches to hysterectomy.

Confusion and misinformation caused by the introduction of new terminology can interfere with evidence-based decision-making. Development of a standardized approach for providing information about hysterectomy and obtaining consent for benign hysterectomy would be helpful. The simple fact is that hysterectomy can be performed through an incision in the vagina, often without but sometimes with additional abdominal incisions of varying size and number. Patients, health care providers, and the public should be aware that scientific evidence supports the use of vaginal hysterectomy. It should also be acknowledged that without sufficient information, patients can easily be convinced to undergo a procedure a surgeon feels most comfortable performing despite evidence the patient would be better served with a different approach. This type of biased patient counseling is unacceptable and must be discouraged. It can no longer be considered standard of care to offer only TAH in all situations without documentation of discussing the specific contraindications to performing vaginal hysterectomy. Furthermore, there is no scientific or cost data to justify offering robotic hysterectomy as the only minimally invasive hysterectomy alternative to TAH. For a patient undergoing hysterectomy, fully informed consent should include a discussion of all types of hysterectomy, a discussion of patient and surgeon factors associated with the recommended...
route of hysterectomy, and documentation of specific contraindications to performing vaginal hysterectomy.

CONCLUSION

Minimally invasive hysterectomy techniques all require advanced skill and experience not easily achieved and maintained by most gynecologic surgeons. The introduction of laparoscopic and robotic technologies has been characterized by significant industry-sponsored marketing and support for training, which has contributed to increased awareness of these techniques. However, scientific evidence of the value of laparoscopy, particularly robotically assisted, to improve outcomes in patients undergoing hysterectomy is lacking. Vaginal hysterectomy is proven as the least invasive, safest, and least costly minimally invasive hysterectomy approach and is the preferred technique. Although laparoscopic hysterectomy can offer advantages in patients with diagnoses of pelvic pain, endometriosis, and uterine immobility as a result of adhesions or nulliparity, it does not offer advantages over vaginal hysterectomy in patients with uterine enlargement, abnormal uterine bleeding, or prolapse, which represent the majority of hysterectomy cases. Many of these patients are still subjected to TAH by gynecologists who do not perform any type of minimally invasive hysterectomy and many more are subjected to robotic hysterectomy. In the current climate of value-driven health care, evidence supports the use of vaginal hysterectomy in treating benign gynecologic conditions. By improving resident training in vaginal hysterectomy, promoting collaboration and referral among practicing physicians to use vaginal hysterectomy, and increasing awareness of the evidence supporting vaginal hysterectomy, more patients will be able to benefit from this hysterectomy approach.

REFERENCES